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1. The aluminum plant, referred to as BAZ (Bogoslovskiy Alyuminiyevyy Zavod) (Bogoslovsk Aluminum Plant) [redacted] and as MAZ Stroy (building project) by others, was located on the western edge of Krasnoturinsk (59°46'N/60°12'E). The city of Krasnoturinsk was built a few kilometers west of the older city of Turinsk, in connection with the construction of the aluminum plant during World War II. The two cities were connected by an asphalted road, 6 meters wide. The plant was connected with the Krasnoturinsk railroad station by a single-track railroad line. Another railroad line, constructed between 1947 and 1949, connected the plant with a railroad spur leading to the Karpinsk (59°45'N/60°09'E) coal mines. A dam and a large reservoir were constructed in the Turys River south of the aluminum plant. The PWS estimated that the reservoir was 5 to 7 km long and 1 to 2 km wide. When the railroad line to the Karpinsk coal mines was constructed, a dam was built in the reservoir. The middle section was left open and was spanned by a steel girder bridge. [redacted] the industrial area around the cities of Karpinsk, Turinsk, and Volchanka (59°57'N/60°05'E) was to be greatly expanded by 1960. One source stated that he saw an educational film showing the proposed merging of these cities into one city. The second source stated that he saw posters in Krasnoturinsk mentioning a plan to expand the city to the size of Leningrad (59°55'N/30°15'E). According to the posters, the industrial area would include the Karpinsk and Volchanka coal mines as well as the aluminum industry and the copper and gold mines of Turinsk. (U)

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3. In 1949, the plant included an aluminum department; an electrolytic department, equipped with 180 to 200 electrolytic cells; and several warehouses, as well as auxiliary shops, including shops manufacturing building materials required for plant expansion, shops for the repair of plant installations and for the preparation of the anodes to be used in the electrolytic department. Electricity was supplied from a large factory-owned, coal-fired power plant which was expanded between 1949 and 1943 and, allegedly, also from a small old heating and power plant. According to four of the PWs, one of the power plants was damaged, on 7 November 1947, by an explosion which caused the complete shutdown for three months of well over half the electrolytic cells. By June 1948, only 100 cells had been put back into operation. In 1949, an aluminum refining installation and an aluminum-rolling mill were under construction. (2)

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4. [] the rate of production in 1947 was 90 to 100 tons of pure aluminum per day, although three sources reported a daily production of only 40 tons. According to two sources, the capacity of the plant was to be increased to 400 tons per day after the completion of all projects. The aluminum was cast in bars about 50 x 25 x 10 cm. Each bar weighed about 35 kg. The completed bars were classified into three grades, according to quality, and were shipped away. According to most sources, no further processing was done in the plant. Only one source stated that household utensils of aluminum were produced in small quantities. (3)
5. Estimates by PWs concerning the number of employees ranged between 1,500 and 5,000 including the construction workers. The majority of the Soviet workers were convicts and deported Volga Germans. In 1949, 300 PWs still worked in three shifts. Three 8-hour shifts were worked in most departments, but four 6-hour shifts were worked in the electrolytic shop. According to two sources, General Baykov (fnu) (sources' spelling) was in charge of the construction work in early 1946.
6. Coal was originally supplied from the Volchanok coal mines. However, it allegedly was very young (sic) and consequently was not suitable for use in the revolving tubular kilns. Therefore, coal from the Karpinsk coal mines was used and, between 1947 and 1949, a new railroad line was constructed. Bauxite was supplied from a large deposit, 70 km north of Turinsk. Deposits adjacent to Turinsk were known but, according to Volga Germans residing in Turinsk, were not yet mined. Soda packed in bags was supplied partly from Germany and partly from Irbit (57-40,N/63-04,E). (4)
7. The plant was protected by wooden and barbed-wire fences and guarded by armed factory militia. Special sentries were posted at various workshops.

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[] Comments.

- (1) For location sketch of the aluminum plant, see annex 1, based on a map of the area and on information from the PWs. It is believed that the published plans concerning the enlargement of the industrial district are, at present, merely propaganda. Even if the aluminum industry and the coal, copper, and gold mining were to be greatly intensified, it would require a considerable period of time to achieve the reported expansion project.

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However, the present report is indicative of long-range plans concerning the enlargement of the Turinsk aluminum industry. One PW stated that the population of Krasnoturinsk was already 120,000 in 1943. Most of the inhabitants were deported Volga Germans. The city had a trolleybus and a streetcar system.

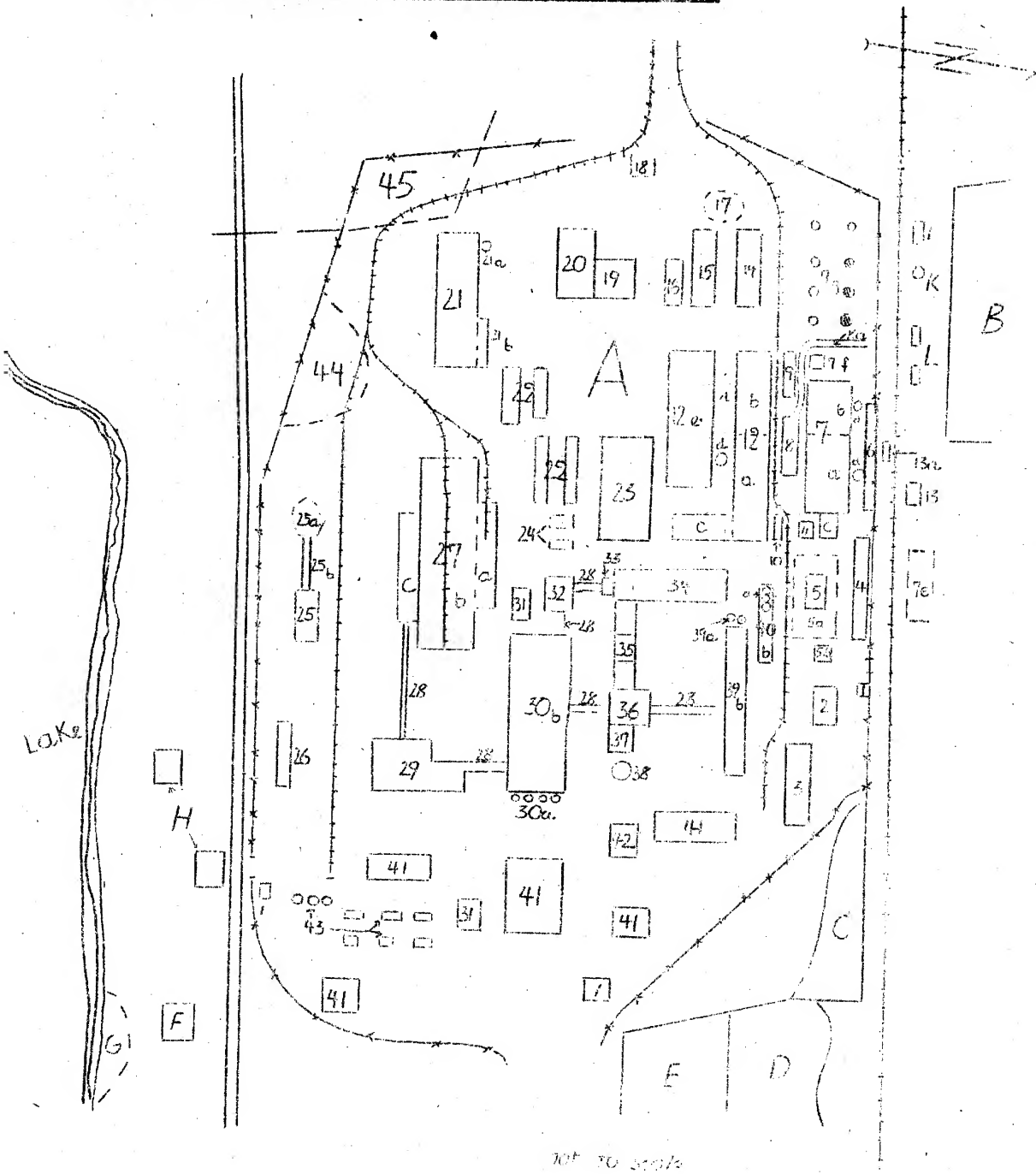
- (2) For layout sketch of the plant, see Annex 2, based on information from all sources. For sketch of the building project "Series No 5", see Annex 3. This sketch was made by a PW who worked on the construction of a drainage system for Series No 5, in early 1949. For sketches of the rotary tubular kilns and the sintering kilns of the alumina department of the plant, see Annexes 4 and 5. The alumina department apparently is operated according to the Heroult method. Conveying equipment is fully mechanized. For sketch of an electrolytic cell, see Annex 4. According to information from the PWs, it appears that continuous-action Soderberg electrodes, which may be used with a current strength of 50,000 amperes, were used in the electrolytic cells. From the statement that a current of 42,000 amperes is used, it is evident that electrolytic cells are modern. Prior to the war, the USSR was going to convert its vats from 25,000 amperes to 32,000 amperes and to experiment with 46,000-ampere vats. By further improving the vat lining, the current strength could be increased to between 50,000 and 55,000 amperes, thus increasing the capacity of the installation by about 20 percent. If the statement by one of the PWs that a current strength of only 10,000 to 20,000 amperes is used is correct, one section of the electrolytic department is still using quite obsolete cells. Several sources mention the existence of a power plant at the reservoir dam, in addition to the two power plants located in the factory area. Other PWs stated that the TEZ power plant was located on the western edge of Krasnoturinsk and referred to it as the municipal power plant. All sources agreed on the existence, expansion, and location of the large power plant and on the existence of the small TEZ power plant.
- (3) In order to obtain 100 tons of pure aluminum daily with a potential of 5 to 6 volts in the bath and a current strength of 42,000 amperes, at least 370 to 400 electrolytic vats would be required, particularly since a number of the vats are defective and are constantly being repaired. According to two PWs, an electrolytic shop, of the same size as the one reported in the older section of the plant, was in operation in the "Series No 5" building site as early as 1949. Therefore, it appears that the reported production rate of 100 tons daily refers to the production of both electrolytic shops. This assumption is supported by the statements of three PWs that the daily rate of production was about 40 tons, which would appear to be the production of only one electrolytic shop, equipped with about 180 to 200 electrolytic cells.
- (4) The bauxite deposit mentioned as being north of Turinsk is that near Zravnaya Shapochka in the district of Pokrovsk, about 70 km north of Turinsk, which is the most important bauxite deposit of the USSR, both in quantity and quality. This deposit supplies the RAZ aluminum plant and also the aluminum factory in Kamensk-Uralskiy (56-22,N/61-52,E). The "stone quarry" mentioned in item 27. c. of Annex 2, may be a bauxite deposit where mining was started in 1943 or 1947.

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Attachment 2

Layout Sketch of the Aluminum Plant BAZ in Krasnoturinsk



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Attachment 2

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Legend:

A. Aluminum Plant BIZ :

1. Three entrances, with guardhouses.
2. Kitchen and canteen.
3. Repair department for the electric power plant. This department was constructed after the war.
4. Workshop, under construction, use unknown.
5. Small TIZ heating and power plant, a fairly old installation constructed in 1943. According to one PW it was equipped with two turbines and 10 to 12 boilers, each 12 meters long and 3 meters in diameter. The plant was fired with coal dust and was equipped with coal mills. According to the measuring instruments, the capacity ranged between 3,000 and 3,500 kw. A long-distance steam heating pipe led from the TIZ to Turinsk.
 - a. Open-air transformer installation with 12 transformers. High tension lines led from this installation to "Gorod No 5", Turinsk, and Karpinsk.
 - b. Water basin.
6. Coal-unloading shop for the large electric power plant, constructed after the war. Four 60-ton freight cars can be unloaded in the shop at one time. The coal is dumped from the cars, through gratings, onto a conveyor belt. When no cars arrived, coal was taken from the large coal piles.
7. New electric power plant which, [redacted] was equipped with 24 boilers. 25X1
 - a. Section completed by 1946, equipped with 12 boilers and three or four turbines.
 - b. Section completed by 1949, also equipped with 12 boilers and four turbines.
 - c. Coal-conveying installation of the power plant.
 - d. Two smokestacks. One PW definitely stated that they were 63 and 76 meters high.
 - e. Coal piles where, according to one PW, about 1,000 tons of coal were stored.
 - f. Pumphouse for the electric power plant, equipped with three or four pumps.
 - g. Cooling towers. All sources agreed that three towers were completed. According to two PWs, the rough brick work of three more towers was completed and two more towers scheduled to be built. The completed towers are shaded on the sketch.

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Attachment 2

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8. Transformer installation of the electrolytic shop.
 - a. Entrance way (Verbindungsgang) to the transformer installation, constructed of reinforced concrete, 2 meters high and 2 meters wide. The entranceway was only mentioned by one PW.
9. Building in which the electrolytic plates were prepared. The installation was mentioned by only one PW.
10. Laboratory.
11. Administration building.
12. Electrolytic shop equipped with a total of 184 electrolytic cells.
 - a. Old section, with 92 electrolytic cells.
 - b. New section with 92 electrolytic cells.

The cells were arranged in four rows of 46 cells each. There was one tapping corridor between each two rows of cells and there were two traveling cranes over each of the two tapping corridors. Aluminum was cast in molds, at the eastern and western ends of the shop. Two PWs stated that each cell was 5 x 3 meters. According to one PW, employed in the electrolytic shop from April 1946 to May 1948, a current of 42,000 amperes and 5 to 6 volts was used. According to another PW, the strength of the current varied between 10,000 and 20,000 amperes in 1947. Each electrolytic cell was in operation without interruption for a period of six months. After that period, it was shutdown for three weeks in order to replace the lining and to make other repairs. The cells were operated with anodes, consisting of one large block each, which were adjusted every 10 to 12 days. The adjustment was made by setting higher the 23 bolts supporting each anode. Three men could adjust the anodes of two cells in six hours.
 - c. Administration of the electrolytic department.
 - d. Two aluminum tanks, 20 to 25 meters high. The aluminum was conveyed to the electrolytic shop from these tanks on electric trucks.
 - e. Large workshop under construction, which was to become a second electrolytic shop, according to two PWs.
13. Railroad station with 10 to 12 tracks.
 - a. Roundhouse.
14. Administration building, according to several PWs. According to one PW, the main laboratory was also located in this building.

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15. Forge, equipped with two large hammers and one large press, according to one PW. The press was made by Browning firm in the U.S.
16. Small foundry, in which spare parts for the plant were made. According to one PW, the foundry was equipped with two cupola furnaces. Another PW stated that a machine shop, manufacturing small tiltable lorries and cranes for the construction work, was located in the same building.
17. Scrap metal yard.
18. Storage shed.
19. Mechanical repair shop RMZ, constructed after the war.
20. Garage with 12 doors.
21. New building, constructed after the war. One PW stated that, according to a Soviet foreman, an aluminum refinery and a rolling mill were to be installed in this building.
 - a. Smokestack, allegedly 36 meters high.
 - b. [redacted] graphitic carbon stones (Kohlegraphitsteine) were produced in this Annex. [Source may have meant the electrodes or the cathode plates.]
22. Storage shed.
23. Mechanical repair department, including a foundry and a forge, according to several PWs. [redacted] the department was equipped with two smelting furnaces, 10 ladles, 10 forge fires, 1 oil-fired annealing furnace, and 2 pneumatic hammers. Component parts for conveyor belts, cranes, and the electrolytic installation were produced here.
24. Two small machine shops.
25. Coal-crushing plant. The coal was pulverized and was conveyed by means of a blower to the heating plant and to the revolving tubular kilns.
 - a. Coal yard.
 - b. Conveyor belts.
26. Storage shed.
27. Soda and bauxite yard.
 - a. Soda yard.
 - b. Bauxite yard.

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Attachment 2

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- c. Hammer type mill used for crushing the bauxite. The yard was equipped with two grab cranes. Soda arrived in sacks. According to inscriptions on the sacks, part of the supplies originated from Germany, in early 1949. According to one PW, rough, uncleaned materials were taken by rail from the so-called stone quarry located in the southwestern corner of the plant to the soda and bauxite yard. The soda was blown from the yard to the ball mill through a pipe line, 70 cm in diameter.
28. Conveyor belts and pipes.
29. Ball mill and mixing department. The equipment included two ball mills, each 15 meters long and 2 meters in diameter, used to pulverize the bauxite. The powder was placed in the mixing boilers, of which there were six to eight, each 8 meters high and 6 to 8 meters in diameter. Soda was added to the pulverized bauxite by compressed air and the compound was mixed with water. After being filtered, the mixture was pumped through a pipe line, 20 cm in diameter, to the sintering and roasting plant.
30. Sintering and roasting plant.
- a. Four sintering kilns, each 12 meters high and 5 meters in diameter, in which the soda-bauxite mixture was, were set up outside the east wall of the shop. The kilns were electrically heated. Each kiln had a short smokestack and contained lath grids with electrically operated beaters to prevent the compound from sticking together.
- b. Four large rotating tubular kilns, 50 meters long and 3 meters in diameter, were installed in the shop. They were set up at an acute angle on concrete bases. The dry mass was blown in through the top. The kilns were fired from below with oil and coal dust. The flame shoots 25 to 30 meters into the kiln. After being baked, the mass was cooled in cooling drums and was removed from the shop by conveyor belts made of iron. The entire department was referred to as "spekaniye" (a Russian word for sintering) by several PWs.
31. Two compressors.
32. Mill installation. The compound from the rotating tubular kilns was dropped through shafts into two mills. The mills were referred to as cone mills by one PW. One PW stated that the mills were 2 meters high and 1 meter in diameter. The compound was pulverized and then taken to the alumina tanks.
33. Elevating tower, 15 meters high.
34. Lixiviating (Laugen) department. The pulverized compound was lixiviated there and was filtered through 10 to 12 linen filters, each about 5 x 2 meters. A sticky white mass was pumped from this department to the carbonizing department.
35. Pump installation.
36. Carbonizing department, referred to as "karbonizatsiya" by one PW. The equipment included 4 boilers, 5 meters in diameter and 8 meters high, and 10 to 12 centrifugal pumps driven by electric motors. From this department the moist mass produced was taken to the two rotating tubular kiln departments.

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Attachment 2

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37. Boiler, with a wood jacket, 8 meters high and 8 meters in diameter.
 38. Sheet steel boiler, 8 meters high and 8 meters in diameter.
 39. Sintering and roasting department, referred to as "spekaniye" by two PWs and as "kaltsianatsiya" by one PW.
 - a. Two asbestos-insulated sintering kilns, electrically operated, 15 meters high and 4 meters in diameter, were set up outside the west wall of the shop.
 - b. Two rotating tubular kilns, like those in the other sintering and baking department, were installed in the shop. The compound supplied from the lixiviating department was baked in the rotating tubular kilns.
 40. a. Three alumina tanks.
 - b. Cryolite storehouse. Aluminum bars were also stored in the same building. The bars bore the trade-mark BAZ, the date of manufacture and the number of the electrolytic cell.
 41. Five small new buildings, not completed as of October 1949.
 42. Administration building.
 43. Tank yard. The tank yard included three vertical tanks, 5 to 7 meters in diameter and extending 10 meters above the ground. Part of each tank was underground. Three to six horizontal tanks, 8 meters long and 2 meters in diameter, were also located in the yard. All tanks were painted dark. The area was enclosed by a separate fence and guarded. The PWs believed that the installation was an oil storage yard.
 44. Storage area, where industrial equipment dismantled in Germany was stored.
 45. Stone quarry. The materials obtained there were taken to the soda and bauxite yard.
- B. Building project, "Series No 5" of the aluminum plant.
- C. Concrete plant.
- D. Municipal power plant.
- E. Sawmill, referred to as "Leso Zavod" (wood factory) [redacted]. It included a department with two saw frames, which had a total capacity of 130 to 140 cubic meters per shift; a timber yard, where roof gables, walls of cantonment buildings, and other items were made; another department with three saw frames, which had a capacity of 30 to 35 cubic meters per frame and shift; and a carpentry shop with 21 wood-working machines.

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Attachment 2

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- F. Water tower.
- G. Pump station.
- H. Two water tanks.
- I. Small new building.
- K. Cooling tower.
- L. Two cemented water basins.

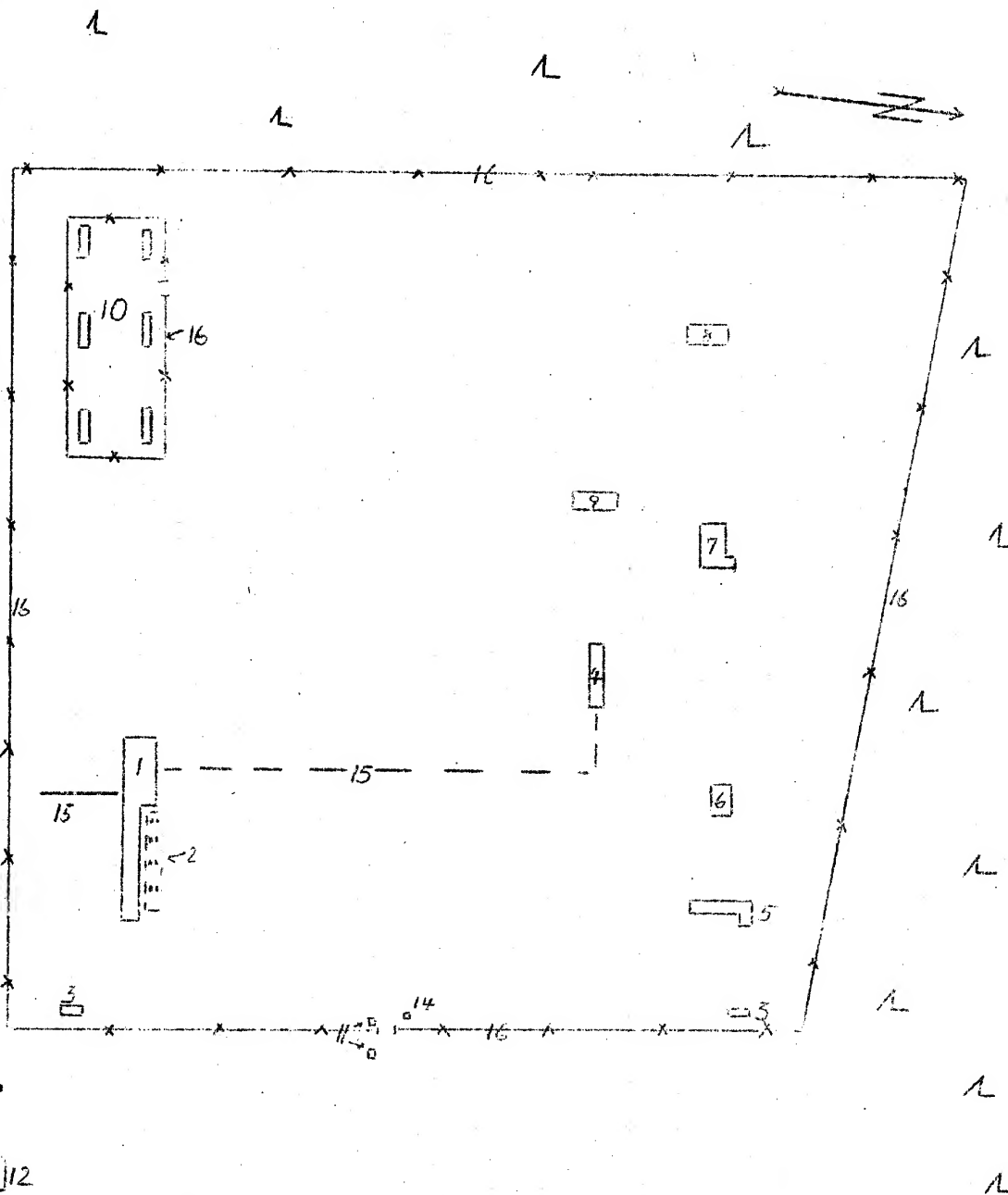
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Attachment 3

Building Project "Series No 5"



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not to scale

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Attachment 3

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Legend:

1. Brick building with skylights and large windows and a porch on the west side.
2. Roofed transformer installation with eight transformers.
3. Two garages.
4. Three-story building, presumably housing a laboratory. The personnel leaving the building wore white coats.
5. Hospital.
6. Brick building with a large flight of outside steps, presumably a clubhouse.
7. }
8. } Three-story apartment houses.
9. Building with exceptionally large windows.
10. Separately fenced-in yard with six small huts. Source believed that the buildings were storage sheds.
11. Gate houses.
12. Turinsk Rudniki railroad station (rudniki = mine)
13. So-called new zone (sic). Foundations for a new large factory compound had been constructed.
14. Tower, about 18 meters high, with 10 searchlights used to light the individual buildings at night.
15. Power line from the aluminum plant to "Series No 5". The cables were laid on a concrete tunnel-like platform, supported on steel transmission towers which were 8 meters high. The concrete platform was 3 meters wide and had sidewalls 2 meters high. On the transmission towers were high voltage warning signs. Another source reported a similar installation near the transformer station of the electrolytic shop.
16. Fences.
17. BAZ aluminum plant.

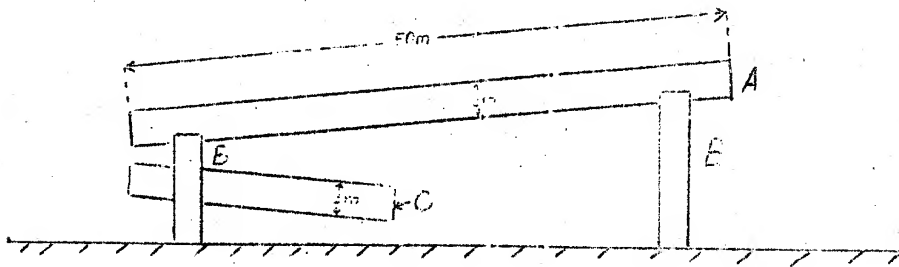
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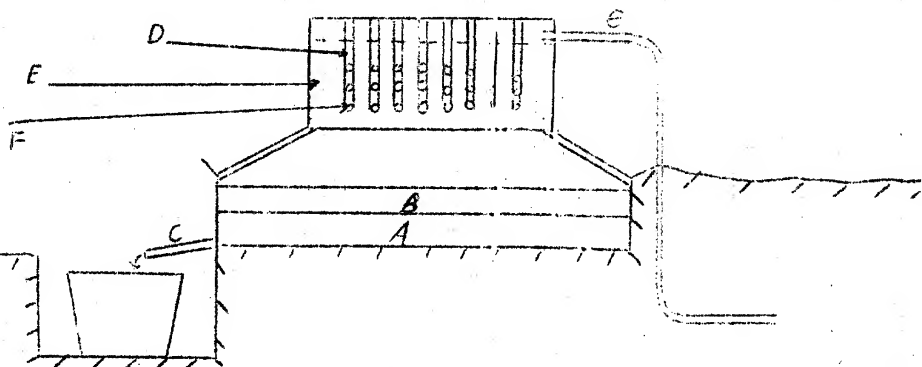
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Attachment 4

Rotating Tubular Kiln



Electrolytic Unit



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Attachment 4

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Legend:

Rotating tubular kiln.

- A. Rotating tubular kiln.
- B. Concrete base.
- C. Cooling drum.

Electrolytic vat.

- A. Liquid aluminum.
- B. Electrolyte.
- C. Tapping channel.
- D. Anode.
- E. Tar-coal charge (Teerkohlenfuellung).
- F. Iron bolt.
- G. Cable.

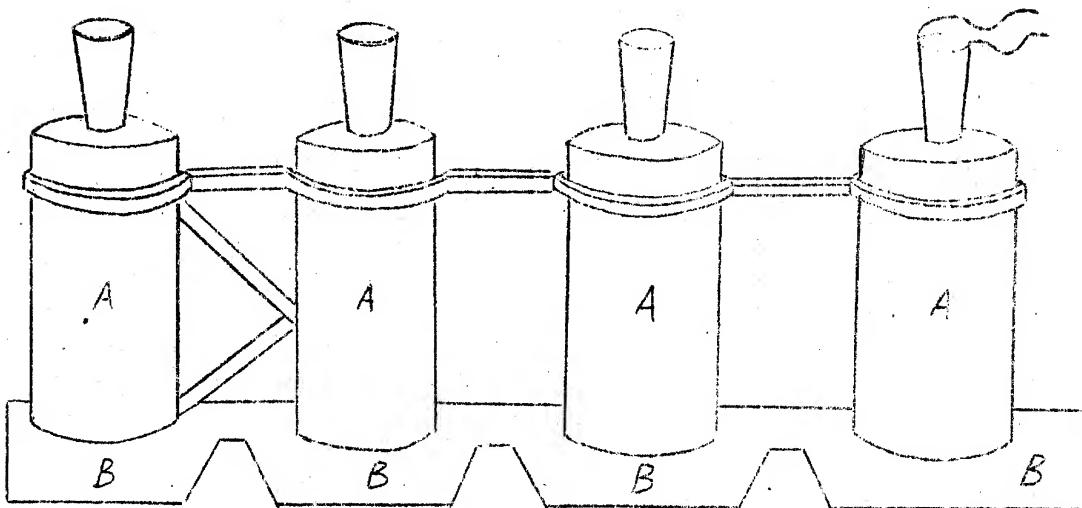
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Attachment 5

Sintering Kilns



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- A. Four sintering kilns, with smokestacks.
- B. Cement foundations.

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